

## **CLAIMS**

1. A railway safety apparatus for detecting looseness of a screw-threaded connector characterized by a rotation indicator associated with the connector so as to indicate rotation from a correctly tightened position.  
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2. Apparatus according to Claim 1 characterised in that the indicator is attached to the connector so that it rotates with it.
3. Apparatus according to Claim 1 characterized in that the rotation indicator  
10 is a moulded component of synthetic plastics material that fits onto the connector.
4. Apparatus according to Claim 2 characterised in that the rotation indicator is in the form of a cap that fits over the connector.
5. Apparatus according to Claim 3 or 4 characterised in that: the connector  
15 has a polygonal shape defining corners between the sides of the polygon, the rotation indicator has internal groves adapted to receive the corners, and the number of grooves is greater than the number of corners so as to allow relatively fine adjustment of the position of rotation of the indicator relative to the  
20 connector.
6. Apparatus according to Claim 1 characterised by visible indicia on the indicator allowing a human inspector to detect visually any significant rotation of the connector from a datum position.  
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7. Apparatus according to Claim 6 characterised in that the rotation indicator is adapted to co-operate with a mobile detector, the mobile detector being designed to inspect a rail-track and to detect rotation indicators which have undergone an undesired rotation.
8. Apparatus according to Claim 7 characterized in that the mobile detector  
30 is mounted on a rail vehicle.

9. Apparatus according to Claim 7 characterized in that the mobile detector is carried by an aircraft.
- 5 10. Apparatus according to any preceding Claim characterized in that the indicator carries a transmitter or transponder for transmitting a signal indicating whether the connector has experienced undesirable rotation.
- 10 11. Apparatus according to Claim 10 when dependant on Claim 7 characterized in that the transmitter carried by the indicator is adapted to transmit a signal in response to an interrogation signal from the mobile detector.
- 15 12. Apparatus according to any preceding Claim characterised in that the indicator is adapted to transmit a heat signal in response to rotation of the connector.
- 20 13. Apparatus according to Claim 12 characterised in that the indicator carries two chemicals which, when mixed, react exothermally, the indicator including means for allowing the chemicals to mix in response to rotation.
14. A rotation indicator for use in a railway safety system according to any preceding claim.
- 25 15. A mobile detector for use in a railway safety system according to Claim 7.
16. A railway safety system for detecting looseness in screw-threaded connectors, the system comprising a transmitter or responder associated with a connector and arranged to give a signal indicating looseness.
- 30 17. A screw threaded connector comprising means for containing separately two chemicals which, when mixed, react in such a way as to emit thermal or

visible radiation; and means for causing such mixing in response to undesired loosening of the connector.

18. A railway system including apparatus according to any preceding claim.